

TEXT OF ALL PENDING, WITHDRAWN, AND ADDED CLAIMS

1. (withdrawn): A low transport efficiency alkali metal ion permselective membrane characterized by less than about 60 % efficiency for the transport of alkali metal ions.
2. (withdrawn): The membrane of claim 1, wherein said membrane has less than about 50 % transport efficiency for alkali metal ions.
3. (withdrawn): The membrane of claim 2, wherein said membrane has less than about 20 % transport efficiency for alkali metal ions.
4. (withdrawn): The membrane of claim 1, comprising a polymer having cation exchange groups.
5. (withdrawn): The membrane of claim 4, characterized by high hydrogen ion transport efficiency.
6. (withdrawn): The membrane of claim 5, wherein said cation exchange groups are selected from the group consisting of carboxylic acid groups and sulfonic acid groups and said polymer is a copolymer of tetrafluoroethylene and chlorotrifluoroethylene.

7. (withdrawn): The low transport efficiency alkali metal ion permselective membrane of claim 3, comprising said membrane having high hydrogen ion transport efficiency and said membrane having cation exchange groups selected from the group consisting of carboxylic acid and sulfonic acid groups.

8. (currently amended): An assembly [[electrolytic cell]] for the continuous, cyclic production of an alkali metal halate [[, said cell]] comprising an electrolytic cell, a gas and liquid disengager for a catholyte stream, and a gas and liquid disengager for an anolyte stream, said electrolytic cell comprising a low alkali metal ion transport efficiency permselective polymer membrane separating an anode compartment and a cathode compartment, and a catalytic, metal anode and a catalytic metal cathode or a catalytic, metal anode and a gas-diffusion cathode.

9. (currently amended): The assembly [[electrolytic cell]] of claim 8, wherein said permselective polymer membrane has less than about 60 % alkali metal ion transport efficiency.

10. (currently amended): The assembly [[electrolytic cell]] of claim 9, wherein said permselective polymer membrane has less than about 50 % alkali metal ion transport efficiency.

11. (currently amended): The assembly [[electrolytic cell]] of claim 10, wherein said permselective polymer membrane has less than about 20 % alkali metal ion transport efficiency.

12. (currently amended): The assembly [[electrolytic cell]] of claim 9, wherein said catalytic, metal anode comprises a precious metal oxide deposited on a tantalum or titanium substrate.

13. (currently amended): The assembly [[electrolytic cell]] of claim 12, wherein said catalytic, metal cathode comprises a precious metal oxide deposited on a nickel or titanium substrate.

14. (currently amended): The assembly [[electrolytic cell]] of claim 9, wherein said cathode is a gas-diffusion cathode.

15. (currently amended): The assembly [[electrolytic cell]] of claim 9, wherein said catalytic, metal cathode is selected from the group consisting of alloy mixtures of nickel-molybdenum, cobalt molybdenum, nickel-tungsten, cobalt-tungsten, nickel-iron, and nickel-cobalt on a nickel or steel substrate.

16. (currently amended): The assembly [[electrolytic cell]] of claim 9, wherein said catalytic, metal cathode comprises an alloy coating of molybdenum, vanadium, and nickel on a copper substrate.

17. (currently amended): The assembly [[electrolytic cell]] of claim 8, wherein said polymer membrane is characterized by less than about 20% alkali metal ion

transport efficiency, high hydrogen ion transport efficiency, and cation exchange groups selected from the group consisting of carboxylic acid and sulfonic acid groups.

18. (withdrawn): An electrolytic cell for the production of an alkali metal halate, said cell comprising an hydrophilic, microporous diaphragm and a catalytic, metal anode and a catalytic, metal cathode or a catalytic, metal anode and a gas-diffusion cathode.

19. (withdrawn): The cell of claim 18, wherein said hydrophilic, microporous diaphragm comprises a polymeric or ceramic material.

20. (withdrawn): The cell of claim 19, wherein said microporous diaphragm comprises a polymeric material selected from the group consisting of a fluorinated polymer and a fluorinated copolymer.

21. (withdrawn): The cell of claim 19, wherein said microporous diaphragm comprises a ceramic material selected from the group consisting of microporous titanium oxide and microporous zirconia.

22. (withdrawn): The cell of claim 19, wherein said hydrophilic, microporous diaphragm is characterized by a pore size of about 0.005 micron to about 1 micron.

23. (withdrawn): The cell of claim 22, wherein said hydrophilic, microporous diaphragm is characterized by a porosity of about 50% to about 85%.

24. (withdrawn): The cell of claim 19, wherein said catalytic, metal anode comprises a precious metal oxide deposited on a nickel or titanium substrate.

25. (withdrawn): The cell of claim 24, wherein said catalytic, metal cathode comprises a precious metal oxide deposited on a tantalum or titanium substrate.

26. (withdrawn): The cell of claim 19, wherein said cathode is a gas-diffusion cathode.

27. (withdrawn): The cell of claim 24, wherein said catalytic, metal cathode is selected from the group consisting of alloys of nickel-molybdenum, nickel-tungsten, nickel-iron, nickel-cobalt, cobalt-molybdenum, nickel-iron, nickel-cobalt, and cobalt-tungsten on a nickel or steel substrate.

28. (withdrawn): The cell of claim 24, wherein said catalytic metal cathode comprises an alloy of molybdenum, vanadium, and nickel coated on a copper substrate.

29. (withdrawn): The electrolytic cell of claim 18, comprising an hydrophilic, microporous diaphragm comprising a polymeric or ceramic material having a pore size of about 0.005 micron and a porosity of about 50 % to about 85 %, a catalytic, metal anode, and a catalytic, metal cathode or a gas-diffusion cathode.

30. (withdrawn): A continuous, cyclic, electrolysis process for the production of an alkali metal halate in which the addition of chromium ions and externally supplied acids or alkalies are eliminated, said process comprising:

A. electrolyzing in an anolyte compartment of an electrolytic cell an anolyte comprising an alkali metal halide and halate, said anolyte separated from a catholyte in a catholyte compartment of by low alkali metal ion transport efficiency permselective membrane characterized by less than 60% transport efficiency for alkali metal ions.

B. maintaining the pH in said anolyte compartment at about 6 to about 7 by adding a sufficient amount of said catholyte to said anolyte compartment and

C. electrolyzing said anolyte to a desired aqueous solution of an alkali metal halate from which said alkali metal halate can be directly crystallized.

31. (withdrawn): The process of claim 30, wherein said catholyte comprises an alkali metal chloride and an alkali metal chlorate which are added to said anolyte compartment of said cell by addition of said catholyte to an anolyte recycle process stream from which chlorine is absorbed and oxygen is separated and said stream is recycled to said anolyte compartment.

32. (withdrawn): A continuous, cyclic, electrolysis process for the production of an alkali metal halate in which the addition of chromium ions and externally supplied acids or alkalies are eliminated, said process comprising

A. electrolyzing in an anolyte compartment of an electrolytic cell an anolyte comprising an alkali metal halide and halate, said anolyte separated from a catholyte in a catholyte compartment by a microporous, hydrophilic diaphragm characterized by a pore diameter of about 0.005 micron to about 1 micron, wherein said catholyte compartment is maintained at a differential pressure of about 1 inch to about 48 inches of water over the pressure maintained in said anolyte compartment.

B. maintaining the pH in said anolyte compartment at about 6 to about 7 by adding a sufficient amount of said catholyte to said anolyte compartment, and

C. electrolyzing said anolyte to a desired aqueous concentration of alkali metal halate from which said alkali metal halate can be directly crystallized.

33. (withdrawn): The process of claim 32 wherein said catholyte comprises an alkali metal chloride and an alkali metal chlorate which are added to said anolyte compartment of said cell by addition of said catholyte to an anolyte recycle process stream from which chlorine is absorbed and oxygen is separated and said stream is recycled to said anolyte compartment.

34. (new): An assembly for the continuous, cyclic production of an alkali metal halate, comprising an electrolytic cell, a gas and liquid disengager for a catholyte stream, and a gas and liquid disengager for an anolyte stream, said electrolytic cell comprising a permselective polymer membrane separating an anode compartment and a cathode compartment, a catalytic, metal anode and a catalytic metal cathode or a catalytic, metal anode and a gas-diffusion cathode.

35. (new): The assembly of claim 34, wherein said catalytic, metal anode comprises a precious metal oxide deposited on a tantalum or titanium substrate.



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